

PENNSYLVANIA

Health Bulletin



No. 60.

HARRISBURG, PA.

AUGUST, 1914.

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PUBLISHED MONTHLY BY
THE STATE DEPARTMENT OF HEALTH
SAMUEL G. DIXON, M. D., LL. D.,
COMMISSIONER.

PROGRESS IN PREVENTIVE MEDICINE IN
PENNSYLVANIA SINCE THE CREATION OF
A STATE DEPARTMENT OF HEALTH

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PROGRESS IN PREVENTIVE MEDICINE IN PENNSYLVANIA SINCE THE CREATION OF A STATE DEPARTMENT OF HEALTH.

The earliest attempts to secure comprehensive local public health acts for any section of Pennsylvania were the local laws applied at the Port of Philadelphia, drafted about 1793 and 1794 directly after the great yellow fever epidemic in 1793.

The first efforts to establish a State Board of Health in Pennsylvania resulted in failure—the bills presented to the Legislatures of 1881 and 1883 failing to pass; and a similar bill seemed destined to meet a like fate in 1885 when the frightful epidemic of typhoid fever in the little town of Plymouth occurred. This epidemic brought the Legislature to a full realization of its responsibility and led to the adoption of the act creating the first Board of Health consisting of six persons, the majority of whom were to be physicians of good standing and having an experience of not less than ten years, and a secretary, to be chosen by the board, who was required to be a physician with similar qualifications and experience. Dr. Benjamin Lee, a most estimable gentleman of New England ancestry, acted as Secretary of the Board and its executive officer for a period of twenty years.

This Board was crippled in its general work by lack of funds and was much circumscribed in its powers and duties. It succeeded in educating as to the value of health, and special appropriations in times of epidemics enabled it to demonstrate to the lawmakers that preventable diseases could be successfully combatted.

The next great step forward was in the city of Philadelphia, the advance being made because of the deadly epidemic of smallpox occurring the latter part of 1901 and extending to 1904. This epidemic

continued so long and resulted in such great loss of life and was of such great financial cost to the city that the public in Philadelphia became aroused and presented a bill to the Legislature in 1903 asking the passage of an act to reorganize the Health Department of that city. Through this legislation the Department of Public Health and Charities was created. The old Board of Health, reduced to three members, was continued as subsidiary for the purpose of formulating rules and regulations, etc.

An eminent Professor, Dr. Edward Martin, was selected for director of the new department, and on the Board was Dr. Charles B. Penrose, a professor in the University Medical School.

During the years 1903 and 1904, Doctor Penrose became actively interested in public health problems and saw the need and possibilities of a properly organized State Department of Health. He made a careful study of public health legislation in the New England states, particularly Massachusetts, and in New York City, and drafted the bill in 1905 under which the present Department was organized. While this bill was before the Legislature, he gave up weeks of his time to personal work in educating the members of the Legislature to the wisdom of passing such a comprehensive law. The time was opportune, for the epidemic of smallpox had become state wide. The State Board of Health had been fighting under a special law passed during the previous session of the Legislature and had done much good work with the aid of a special appropriation.

It was this smallpox epidemic, then, beginning in 1901, that two years later started the progressive health movement in Philadelphia, and the same epidemic extending throughout the State assisted Doctor Penrose very materially in having his bill enacted into law during the 1905 session of the Legislature.

The year 1905 is thus a memorable one in the history of Pennsylvania from the standpoint of public health, because in that year the broad acts, upon which the Department is organized and from which it derives its authority, were passed by the Legislature during the month of April: First, an act creating a Department of Health and defining its powers and duties; second, an act to provide for the immediate registration of all births and deaths throughout the Commonwealth; and third, an act to preserve the purity of the waters of the State for the protection of public health.

These three laws were passed as separate acts, the companion bills being drawn in anticipation that the act creating the Department of Health would become law; hence, the provision that in preserving the purity of the waters and in the collection of vital statistics, all should be done under the general supervision of a Commissioner of Health who is also an executive member of the new department.

In one session of the Legislature, Pennsylvania, then, was given a Department of Health with police powers exceeding those in any other State of the Union, and the responsibilities were placed upon the executive of the new department.

The act creating the Department of Health in Pennsylvania is typical of modern legislation in giving its executive an advisory board to call upon for consultation and the approval of rules and regulations best suited to carry out the new laws.

This act gives very broad power in that it grants authority to the Commissioner of Health "to determine the most practical means for the suppression and prevention of disease." He may decide what assistants are necessary to carry out work imposed upon the Commissioner and appoint those assistants. It enables the Commissioner to purchase all the materials and supplies necessary for carrying on his work; to issue subpoenas requiring attendance and testimony; to issue warrants to sheriffs, constables, and policemen requiring the apprehension of those who have violated quarantine regulations; to enter personally or by his agents, without fee or hindrance, examine and survey all grounds, school, apartments, buildings, and premises suspected of containing nuisances, or where questions arise affecting the security of life and health, and to confer the power of constable on any of his agents for this purpose. He may order the abatement of nuisances, remove and enforce quarantine regulations; has general supervision of State registration of births, marriages, deaths, and communicable diseases; of practitioners of medicine and surgery, and of midwives, nurses, and undertakers, in all matters pertaining to such registration.

The act providing for the prevention of the pollution of public waters delegates all authority for protecting the streams and other sources of supply of potable waters to the Commissioner of Health, with the concurrence of the Governor and the Attorney General, and, together with the act creating a Bureau of Vital Statistics, providing for the registration of births and deaths, completes the ground work upon which the present organization is based.

Previous legislation in this Commonwealth had provided for the organization of local Boards of Health in cities, boroughs and townships having a population of more than two hundred and fifty to the square mile.

The present central public health organization in Pennsylvania has direct executive control over all public health problems of every sort in the second-class townships* of the Commonwealth, or in other

*Townships having a density of population less than two hundred and fifty to the square mile are townships of the second class. There are 1,783 such townships in the Commonwealth. Townships with a density of population exceeding two hundred and fifty to the square mile are termed townships of the first class and in Pennsylvania such townships are required to maintain Boards of Health. There are forty-six such townships in the Commonwealth.

words, of a territory comprising more than four-fifths of the area of the Commonwealth, practically covering 40,000 square miles, and containing more than one-quarter of the entire population, a total approximately of two and a half millions. In addition, it has advisory and supervisory control over all the public health agencies for the remaining area and population of the Commonwealth. The Sanitary Engineering work, the Tuberculosis work, and the collection of Vital Statistics, are not limited in any particular by local governments or by local government boundaries.

In the handling of communicable disease absolute executive control is limited to the country side, that is, to practically four-fifths of the land area, municipalities having their own boards of health being expected to look out for communicable disease within their boundaries, the Department only assuming executive control when these boards neglect their duties and perform the work in a way that may become a menace to the public at large.

Within such broad police powers conferred upon a single department a great deal would naturally be expected. The wisdom, however, of such liberal laws amply justifies their adoption when the executive authorities aim to keep close to the people and keep them advised constantly as to what the next advanced step will be. With such broad powers granted in the beginning it does not become necessary to await another session of the Legislature to secure additional power to take up new lines of work, and this very liberality in providing for the plan of organization enables the executive and the Advisory Board to develop plans as they go along, adding a Division, a Bureau, or a new line of work as the occasion demands.

Even better than the admirable law passed in 1905, providing for the organization of the Department, was a most liberal appropriation, thus enabling the entire Department and the Chief of each of its Divisions to enter heartily into the work without question that results would be accomplished, and that each individual would be able to see something of the results.

We feel that whatever degree of success we have met with in Pennsylvania may be in good part attributed to the liberal financial support and to our ability by means of this support to grow rapidly and to show results quickly. Such results can only be accomplished when liberal laws are supported by liberal appropriations. Limited laws with small appropriations would have entailed a very much slower development of the work.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HEALTH

CIRCULARS OF
INSTRUCTION

LECTURES
WITH
EXHIBITS

ANNUAL
REPORTS

MONTHLY
BULLETINS

NEWSPAPER
TALKS

PUBLIC
ADDRESSES

SCIENTIFIC
PAPERS

EDUCATIONAL
LEAFLETS

DIVISION OF
AUDITING
ACCOUNTING
PURCHASING

COMMISSIONER
OF
HEALTH
ADVISORY
BOARD

DIVISION
OF
SUPPLIES

DIVISION
OF VITAL
STATISTICS

DIVISION
OF MEDICAL
INSPECTION

DIVISION
OF SANITARY
ENGINEERING

DIVISION OF
TUBERCULOSIS
DISPENSARIES
NURSING AND
SOCIAL SERVICE
IN HOMES

DIVISION OF
TUBERCULOSIS
SANATORIA

BUREAU
OF
HOUSING

DIVISION OF
LABORATORIES

DIVISION OF
DISTRIBUTION
OF BIOLOGICAL
PRODUCTS

SCHEME OF ORGANIZATION

SCHEME OF ORGANIZATION.

In June, 1905, Governor Pennypacker appointed the first Commissioner of Health for the State of Pennsylvania, and shortly after this the organization of the newly created Department was undertaken. The executive is the Commissioner of Health, and for purposes of executive control important executive divisions have been established and organized, the Bureau of Housing being the last to be added. The correlation of the extremely varied work of the Department is outlined in the accompanying diagram.

The chief of each of these divisions derives his authority from the Commissioner and makes all reports directly to that officer. You will note, as indicated on the plan, that the Division of Accounting, Auditing, and Purchasing does all of the auditing and all of the accounting. It does all of the purchasing for the tuberculosis work and also purchases certain supplies for some of the other departments. Supplies for the general work are procured by the Board of Commissioners of Public Grounds and Buildings. In this way the executive officers of the divisions are left free to do the essential executive public health work. The Division of Supplies attends to the storing and shipments of the various kinds of supplies that are required for executive work.

It will be seen, as the plan is intended to show, that reports of investigations of executive and field work after they pass into the hands of the Commissioner are rewritten and re-edited and from each such report, whatever it has in it of public interest or of educational value is reflected back to the public, with its useful educational lesson couched in language so simple and plain that the layman may readily grasp its meaning.

The observant reader will note that circulars of instruction, our traveling exhibits with lecturers attending, annual reports of the work of the Department, the monthly bulletins issued by the Commissioner and the weekly newspaper talks given out by him, the various public addresses, scientific papers, and educational leaflets, all carry back to the public a knowledge of preventive medicine that prepares them for a large expenditure of funds and for liberal co-operation.

Taking each of the executive divisions in turn: The Division of Vital Statistics is organized with a Registrar in charge, an office staff of twenty-five or thirty persons, and a series of 1,170 local registrars, each with a deputy. These men receive all birth and death certificates in their respective communities and transmit them to the Department. In this Bureau of Vital Statistics practically all the statistical work of the Department is done; the registration of births and deaths, morbidity statistics, and marriage licenses, and the tabulation

of school statistics, statistics of the various dispensaries and sanatoria of the Department. All important statistical work is done here. The same bureau also supervises the copying and transmitting of copies of birth and death certificates to the office of the Federal Census in Washington. The original copies of all of these various statistics are catalogued, bound, and filed in fireproof vaults and will be kept indefinitely for legal and social purposes. Here, too, certified copies of vital records may be obtained when required to establish identity or for other uses in legal proceedings.

The Division of Medical Inspection as organized consists of a Chief Medical Inspector, an Associate, an Assistant, a Chief Clerk, 66 County Medical Inspectors, 105 Deputy Medical Inspectors, 649 Health Officers, these persons contributing largely of their time to the problems connected with general sanitation and the handling of communicable diseases, and a corps of 921 School Medical Inspectors, who make both medical and sanitary inspection of schools in the rural districts and municipalities having a population of less than five thousand.

The Division of Sanitary Engineering is organized with a series of sub-divisions and a total staff of about one hundred and six persons. Through the office of the Chief Sanitary Engineer must pass all plans for the building or extending of water works, sewerage systems, and sewage purification works, and the preliminary sanitary surveying where municipalities propose to build water works. All stream sanitation looking toward the prevention of the pollution of the waters of the State is carried on by officers of this division.

The fourth and fifth divisions of the organization are devoted exclusively to tuberculosis work. The Division of Tuberculosis Dispensaries is supervised by a Medical Inspector in charge, his assistant, two supervising nurses and a statistician. The Department has provided dispensaries for the treatment of those who are unable to pay for such services, in every municipality of any size in the Commonwealth. At the present time 119 of these tuberculosis dispensaries are in operation, having connected with them two hundred physicians and one hundred and nineteen nurses trained in sociological work.

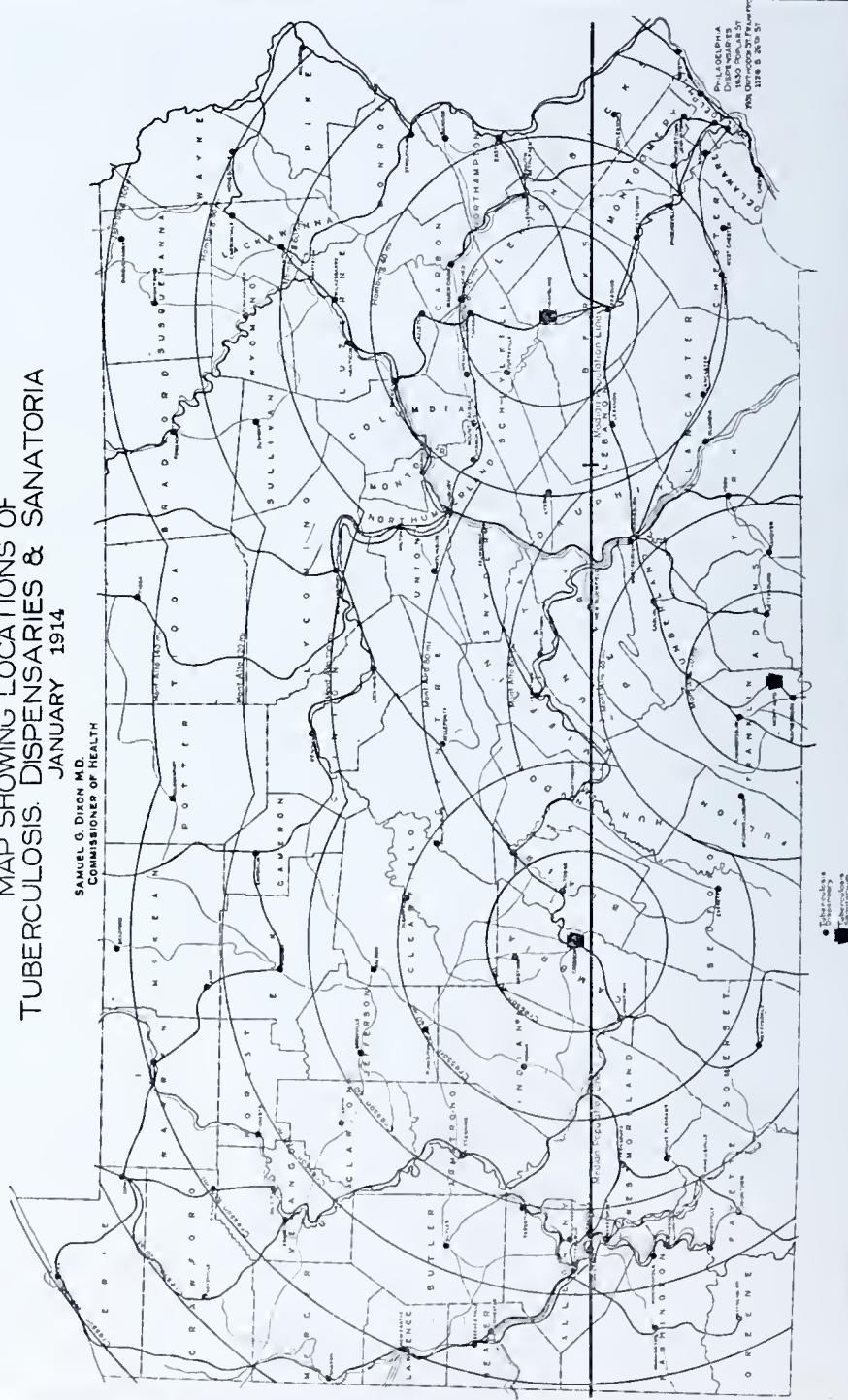
The distribution of dispensaries and the location of sanatoria are clearly plotted on the accompanying map.

Pennsylvania's great centres of population are in the valleys of the three river systems, a large population being grouped about the junction of the Allegheny and Monongahela and along the Ohio below this junction; a large centre of population along the Susquehanna in the vicinity of Harrisburg, with additional large centres up the North Branch in the anthracite coal region about Wilkes-Barre and the neighboring Scranton; and the greater centre of population in the



COMMONWEALTH of PENNSYLVANIA
DEPARTMENT OF HEALTH
DIVISION OF TUBERCULOSIS DISPENSARIES
MAP SHOWING LOCATIONS OF
TUBERCULOSIS DISPENSARIES & SANATORIA
JANUARY 1914

SAMUEL G. DIXON M.D.
COMMISSIONER OF HEALTH



southeastern section of Pennsylvania along the Delaware and its branches, Philadelphia and the cities in the valleys of the Schuylkill and the Lehigh.

The heavy line drawn across the map shows the median line of the population of the State north and south; the short vertical line in Lebanon county shows where a median line of the population east and west would cross it.

These population factors were considered in determining the locations for the various sanatoria which are indicated by the keystone.

Every large centre of population and each county has a tuberculosis dispensary—several counties have more than one, Allegheny having six and Philadelphia three.

All patients seeking admission to any of the Department's tuberculosis sanatoria must make their application for admission at one of the Department's dispensaries and must there be examined and listed for admission. In addition all members of such patient's family and any poor who are unable to go to the sanatoria receive the advice and aid of the dispensary doctor and nurse so long as they require it. The work of the Dispensary Division and that of the Sanatoria dovetail into each other so closely that each is constantly informed of all details of the other's work.

As soon as a patient is discharged from a sanatorium the Chief Inspector of the Dispensary Division is notified and in turn he notifies the dispensary doctor, who takes up further supervision and watchful nursing care at home. All persons discharged from the sanatorium are followed up by the dispensary nurse or physician twice a year or oftener for at least four years. Complete written reports are prepared as to their condition of health and financial capacity, these reports being checked against the original hospital records, and a similar method is worked out for cases discharged from the dispensaries. Eventually these records are bound to prove of the very greatest value in determining lines of endeavor in furthering the campaign against tuberculosis.

There are three Sanatoria for the care of the tuberculous, each easy of access and convenient to large centres of population. The Sanatoria are of great size and are thus constructed because of economy in administration. Mont Alto Sanatorium in South Central Pennsylvania is at present the largest tuberculosis sanatorium in the world, having 1,146 beds in operation. Cresson, the second State institution is located just west of the crest of the Alleghenies, along the Pennsylvania Railroad, and has 344 beds; the second wing now under way will increase the capacity to 432 beds. Hamburg, the third sanatorium, is located at the foot of the Blue Ridge Mountains in Berks county,

in the southeastern part of the State, and will open in a couple of months with upward of five hundred beds. In Pennsylvania the entire tuberculosis problem is believed to be first, last, and all the time, a public health problem; and the dispensaries and sanatoria are held to be the strong arms of public health machinery that should be operated by Health Departments. With the opening of the Hamburg Sanatorium the total number of free beds for the treatment of tuberculosis in Pennsylvania will be nearly two thousand, and with the completion of the new wing at Cresson more than this number of beds will be available.

Provision was made by the last Legislature for the organization of a Bureau of Housing in the Department of Health and to extend its responsibilities everywhere except to the first-class city of Philadelphia, for which a separate Housing Bureau was created. The act became a law at the end of the session after the budget of the Department was already approved and no special funds were appropriated for organization. The Commissioner will soon appoint the chief of this bureau and hopes to have sufficient money available from the general fund to complete at least the essential parts of organization and to show enough striking results between now and the coming session of the Legislature in January, 1915, that liberal financial support for this new bureau may be forthcoming.

Early in the history of the organization of the Department, a laboratory was planned and placed at the disposal of the physicians of the Commonwealth. Sputum of persons suspected of having tuberculosis, cultures, swabs, and smear preparations from the throat, blood samples, the various excreta from the body, even tissue believed by the attending physician to be diseased, are sent to the laboratory. An enormous amount of work is done in studying the waters of the State. In recent years the Department has taken over the manufacture of all tubercle bacilli products used in the State's dispensaries and sanatoria, and has in addition conducted research work along many scientific lines.

The Division for the Distribution of Biological Products was early established and has grown so that at the present time we have 671 local distributing stations where physicians may secure diphtheria antitoxin free of cost to those unable to pay for it; Philadelphia and Pittsburgh manufacture and distribute for their own municipalities. At least one of these stations convenient for each county is kept stocked at all times with tetanus antitoxin put up in doses suitable for immunization and just prior to the Fourth of July these special "tetanus" stations are well stocked with immunizing doses and the public and all physicians throughout the entire State are advised where it may be secured.

Within the circle in the plan of organization appears the word "educational." Those devoting their time to this particular part of the work of the Department are directly connected with the offices of the Commissioner himself and practically all material given out of educational value is personally supervised by the Commissioner.

Many avenues are open for educational campaigns but none are so valuable in the long run as the public press. Fortunately in Pennsylvania there are more newspapers and publishers than in any other single state in the Union. There are 211 daily papers printed and circulated within the Commonwealth and more than 700 weekly and monthly publications printed in the State. The Department has had the hearty co-operation of these 900 publications.

Traveling Exhibits. The Tuberculosis Exhibit, the School Hygiene Exhibit, Infant Welfare Exhibit, each of these carries useful lessons throughout the Commonwealth and as near to the homes of the public as we are able to get them. These exhibits have already been in every large centre of population in the Commonwealth. Valuable educational assistance has been given by the various charitable organizations, civic clubs, philanthropic societies; circulars of instruction are printed, some in many tongues, and sent broadcast. The clergy at least annually and in many instances more frequently preach public health sermons concerning tuberculosis, the diseases that cause infant mortality, and other preventable diseases.

Beginning with the organization of the Department in 1905, \$400,000 was appropriated for the biennial period, with an emergency fund of \$50,000. In the following sessions of the General Assembly these appropriations were made, each covering a period of two years:—

1907,	\$2,100,600
1909,	3,000,000
1911,	3,624,000
1913,	4,179,280

The tuberculosis work was started in 1907, hence the increase to over two millions, one million being for tuberculosis work, and the heavy increases ever since have been for tuberculosis work, the bulk of them being for sanatoria buildings and for the maintenance of indigent patients suffering from tuberculosis.

The Division of Vital Statistics has received and recorded since the organization of the Department 1,558,315 birth certificates; 914,655 death certificates; 489,560 marriage certificates; 62,805 certificates of stillbirths. These original certificates are all catalogued, bound in volumes, tabulated, and filed away in fireproof vaults of the Capitol, and what is of prime importance is that Pennsylvania has good vital statistics and records of incalculable value to future generations. Eventually this division will earn the greater part of its operating ex-

penses through the fifty cent fee exacted for certified copies in the settling of inheritances and satisfying court records and insurance records, and in issuing labor certificates.

In the Division of Medical Inspection in the single year of 1913, some 33,000 premises were visited by health officers and some sort of quarantine established; and with expiration of quarantine 58,000 rooms were disinfected by means of formaldehyde gas.

In the Medical Sub-Division of School Inspection for 1913 we reached 305,000 school children and 11,000 school rooms. In each of these buildings a complete medical and sanitary inspection was made, and during the school year just closed we shall reach more than 400,000 pupils and more than 14,000 school rooms. Letters are annually sent to parents calling attention to each remediable defect and letters go to the secretaries of school boards calling attention to the insanitary things found by our inspectors. Letters were sent to parents, calling attention to the defects found in 210,000 pupils during a single school year.

The Division of Sanitary Engineering, in addition to making preliminary studies for the Commissioner of all contemplated sewerage systems, sewage disposal works, water filtration systems, and the filing of complete sets of plans for such works, points with some degree of pride to the fact that up to the end of 1913 more than 52,652 separate stream pollutions were permanently abated; with the approval and under the stimulus given by the Department, 184 sewerage systems were built or were in the course of construction; 85 sewage treatment plants were built and six were in the course of construction, fourteen of them being for large municipalities; one hundred water purifying plants were built, twenty-five being for municipalities, seventy-two for water companies, and three institutional plants.

In the Division of Tuberculosis Dispensaries, from the end of 1907 up to the first day of May, 1914, 68,180 tubercular persons were examined and, in addition, 18,589 persons, often other members of the family, were examined and not found to have definite signs of the disease, and during this time the trained nurses doing dispensary and sociological work made 668,286 visits to the tubercular sick in their homes. Nearly 7,292,000 quarts of milk have been furnished the needy free of cost. The sanitary teaching in the homes by the nurses cannot, of course, be accurately estimated.

In the Sanatoria much has been accomplished. At Mont Alto, the largest, from the opening date in 1907 up to May 1st, we treated 11,569 patients, each remaining for an average stay of four months and each being followed up twice a year as already stated. Of this number 48 per cent. were classed as far advanced, 38 per cent. as

moderately advanced, and 14 per cent. as incipient cases. The Cresson Sanatorium treated in the first sixteen months of its existence 1,169 patients.

The Division of Laboratories has accomplished a great deal of work of value to the physicians of the State. Some 342 specimens of blood have been studied for malarial parasites; 4,585 Widal tests have been made; 40,311 sputum analyses have been performed in the laboratory, and analyses of other excreta of the body have been made in 1,252 instances; 734 pathological fluids, such as fluids coming from the chest after pleurisy, have been studied; 1,419 morbid growths, most of them sent in from persons presumably afflicted with cancer; 479 specimens of feces have been examined; and 40,822 samples of water have been analyzed in the laboratory, or a total of nearly a hundred thousand specimens in nine years.

In addition to all these analyses, products of the tubercle bacillus are manufactured for dispensary and sanatorium use. Pennsylvania was the first to produce a degree of immunity to tuberculosis. It was published in the Medical News of Philadelphia as early as the year 1889. The water extract of the tubercle bacillus was published in the Medical News in 1890. The laboratory has put out some thirty thousand doses of these products within the last two years; that is, since it took over their preparation.

Through the distribution of other biological products up to the end of 1913, some 46,000 persons have been immunized against diphtheria and 57,000 persons treated. More than 150,000 packages of serum have been distributed to accomplish this result, and in addition 800 packages of tetanus antitoxin have been distributed free to the poor.

In addition to this distribution, vaccine virus has been widely shipped throughout the State each time smallpox developed.

Results in public health work can best be shown by figures. The death rate in Pennsylvania from all causes in 1906 was 16 in each thousand of population. The general death rate has declined year by year until for the year 1912 it was 14 in the thousand, and in 1913 it was 14.5.

DEATHS IN PENNSYLVANIA—1906 TO 1913 INCLUSIVE.

Year.	Population.	Deaths from all causes.	Rate per thousand.	Saving as compared with 1906.
1906	7,141,766	114,435	16.0	
1907	7,279,792	115,969	15.9	508
1908	7,417,816	112,246	15.1	6,439
1909	7,555,841	111,062	14.7	9,831
1910	7,693,866	119,815	15.6	3,287
1911	7,831,904	111,292	14.2	14,918
1912	7,969,942	111,842	14.0	15,677
1913	8,107,980	117,995	14.5	11,733
Total saved,				61,493

In this convenient tabulation is shown what would have resulted if the death rate of 1906 had continued during the seven following years, and it appears that considerably more than sixty thousand lives may be considered to have been saved by public health work in the Commonwealth.

Those who are statistically inclined frequently attempt to show results in dollars and cents. Political economists nowadays rate the average life, deaths at all ages being taken into consideration, at from \$1,700 upward, courts placing the valuation as high on the average as \$5,000, but for the sake of our discussion let us put the rate at the minimum of \$1,700, the figures used by Prof. Irving Fisher in the Report of the Committee of One Hundred. Calculating the saving in dollars and cents with the even number of 60,000 lives, we shall readily see a saving amounting to \$102,000,000. The appropriations to the Department of Health ran a little under eleven and half million dollars during the time under discussion, let us say, an even twelve million for convenient calculation, and let us estimate that an equal amount of twelve million was appropriated to Health Departments in various municipalities and to other agencies doing work closely allied to public health work; we are perhaps considerably too high, but let us grant twelve million dollars for this sort of thing and add an additional six million dollars as that supplied by the philanthropic and charitable agencies contributing largely in the educational campaign, making a total of thirty millions of dollars. Counting this outlay of thirty million dollars as an investment, there has been in the saving of \$102,000,000 in human life alone not only a return of the original capital put in but an additional return of seventy-two million dollars; in other words, the investment has made a clear profit of two hundred and forty per cent. over and above the amount laid out. Such an investment would satisfy any capitalist in the world. In this calculation no account whatever has been taken of the enormous financial saving from preventable illness.

The activity of the Department has been in co-operation with many boards of health in urban communities and other agencies which contribute to the sanitary uplift. The State Department of Health has been, however, directly in charge of public health conditions in rural districts with a total population of more than two and a half million and has had direct supervision of a much larger population than that of any other single agency; and through its tuberculosis work and sanitary engineering work and distribution of diphtheria antitoxin has reached every municipality in the Commonwealth and has stimulated many communities into doing more effective work.

In 1905 the death rate from typhoid fever was 54.8 per hundred thousand. By the end of 1913 it dropped to 18.1 in the hundred thousand, a decline in the death rate of sixty-seven per cent. For the in-

terval a careful calculation would show a saving of at least one hundred thousand cases of typhoid illness. It is fair to claim that this decline is largely due to the installation of better water works, to the installation of sewerage works, to the abatement of nuisances that are a menace to health and likely to pollute water supplies, and to the establishment of proper restrictions and safe regulations on premises from which milk and milk products are sold.

The death rate from diphtheria in 1906 was 34.1 per hundred thousand. By the end of 1913 it dropped to 25.8. Here all agree that the distribution of diphtheria antitoxin for curative and immunizing purposes, educational work, and the proper administration of quarantine and the establishment of safe regulations for the sale of food products have been responsible for much of the decrease.

The death rate from all forms of tuberculosis in 1906 was 150.9 per hundred thousand. By the end of 1913 it had dropped to 120.9 per hundred thousand. Here, too, it will be agreed that the active tuberculosis campaign has contributed in a telling way; the work of the Dispensaries and Sanatoria of the Department, the lessons impressed by our nurses, the influence of the various small Sanatoria, all have been contributing largely, whether governmental, endowed, or private.

Even in some of the communicable diseases where physicians are somewhat skeptical as to the result of quarantine, figures seem to show practical results. In whooping cough the death rate in 1906 was 21.7; in 1913, 11.7; the rate was cut almost in half. From 1,550 deaths in 1906 the number dropped to 898 in 1913, notwithstanding the increase in total population. Prior to 1905 practically no control of whooping cough was undertaken, even in our large cities, and yet this disease dropped steadily year by year with better supervision until today the death rate itself is enough to justify the precautions that were taken.

With measles and scarlet fever and the various other contagious diseases similar declines in death rates can be shown, although not so graphically as with some other communicable diseases. For one disease, unfortunately, no such results have been shown. Cancer in 1906 was responsible for the death of 4,208 persons and in 1913, 5,854 deaths are attributed to this disease. The death rate has increased from 58.9 to 72.2 in each hundred thousand.

The recital of what has been accomplished in Pennsylvania since the creation of the State Department of Health is certainly encouraging.

PENNSYLVANIA HEALTH BULLETINS.

No.	Date.	Subject.
1.	July, 1909.	The Disease-Breeding Power of House-flies; Method of Prevention.
2.	Aug., 1909.	Note on Similarity of Barium Carbonate Poisoning and Rabies in Dogs.
3.	Sept., 1909.	The Family Physician.
4.	Oct., 1909.	Legal Rights and Tuberculosis. The Public Drinking Cup.
5.	Nov., 1909.	The Germicidal Effect of Water from Coal Mines and Tannery Wheels upon <i>Bacillus Typhosus</i> , <i>Bacillus Coli</i> , and <i>Bacillus Anthracis</i> .
6.	Dec., 1909.	Report on Effect of Repeated Injections of Products of the Tubercle <i>Bacillus</i> on Lymphatic Organs.
7.	Jan., 1910.	Little Dangers to be avoided in the Daily Fight against Tuberculosis.
8.	Feb., 1910.	The Object to be Attained by the Medical Inspection of School Children.
9.	March, 1910.	Conservation of Human Life in Pennsylvania. The Results of Four Year's Work of the Department.
10.	April, 1910.	The Biological Treatment of Tuberculosis as Conducted by the Department.
11.	May, 1910.	The Bubonic Plague, its Origin, Progress, and Means of Prevention.
12.	June, 1910.	A Retrospective Glance. 1. Susceptibility of Tuberculosis. 2. Purity of Milk. 3. Bovine Tuberculosis.
13.	July, 1910.	Experiments on Tuhercile <i>Bacilli</i> , Old Tuberculin, and the Fluid of Dixon.
14.	Aug., 1910.	The Conservation of Child Life in Pennsylvania.
15.	Sept., 1910.	Obedience to Nature's Laws the Primary Defence against Disease.
16.	Oct., 1910.	The Conservation of Infant Life in Pennsylvania.
17.	Nov., 1910.	Pennsylvania's Standing Army of Health.
18.	Dec., 1910.	Producers and Consumers. Pennsylvania's Tuberculosis Schools.
19.	Jan., 1911.	The Effect of Injections of Taurin upon Tumors of Mice and Dogs.
20.	Feb., 1911.	Some Duties, Ideals, and Opportunities of the Country Doctor.
21.	March, 1911.	Malaria; How it is Caused, and How to Get Rid of it.
22.	April, 1911.	Health.
23.	May, 1911.	The Common Fly. How it Develops. Why it must be Destroyed, and How to Destroy it.
24.	June, 1911.	Effects of Products of Tubercle <i>Bacilli</i> on Epithelium.
25.	July, 1911.	Five Years of Tuberculosis in Pennsylvania.
26.	Aug., 1911.	Organization of the Pennsylvania State Department of Health.
27.	Sept., 1911.	Tuberculosis, in the Country as well as in the City, a Disease of Bad Housing and Lack of Nourishing Food.
28.	Oct., 1911.	The Preparation of the Biological Products Distributed by the Pennsylvania Department of Health.
29.	Nov., 1911.	The Foundations of State Medicine.
30.	Dec., 1911.	Experiments Tending to Show the Infrequency of the Occurrence of Tubercle <i>Bacilli</i> in the Urine of Patients Suffering from Pulmonary Tuberculosis.
31.	Jan., 1912.	The Baby the Most Important Problem in Modern Life.
32.	Feb., 1912.	Insects. The Common Forms in Relation to Public Health, and Methods for their Destruction.
33.	March, 1912.	The Opportunities for the Trained Nurse in Sanitary Service.
34.	April, 1912.	How to Organize a Baby-Saving Show.
35.	May, 1912.	Drowning.
36.	June, 1912.	The Health of Suburban Residences.
37.	July, 1912.	Report of the Austin Disaster.
38.	Aug., 1912.	Getting Close to the People. Caring for the School Children.
39.	Sept., 1912.	Modern Medicine and the Physician.
40.	Oct., 1912.	Battling for Health at Mont Alto.
41.	Nov., 1912.	Tuberculin.
42.	Dec., 1912.	Conservation of Health. An Address before the Duquesne Chamber of Commerce.
43.	Jan., 1913.	Municipal Sanitation.
44.	Feb., 1913.	Tuberculosis and our Schools.
45.	March, 1913.	The Relation of the Undertaker to the Public Health.
46.	April, 1913.	What State Control over Streams has done in Pennsylvania in Seven Years.
47.	May, 1913.	Troy Typhoid Fever Epidemic.
48.	June, 1913.	The Registration of Vital Statistics a Social Service.
49.	July, 1913.	Pennsylvania's Eugenic Marriage Law.
50.	Aug., 1913.	Pennsylvania Health Legislation of 1913.
51.	Sept., 1913.	Health and Education. An address before the Pennsylvania State Educational Association.
52.	Oct., 1913.	Relation of Public Health to Industrial Welfare. An address before the Welfare Efficiency Conference at Harrisburg.
53.	Nov., 1913.	Bathing.
54.	Dec., 1913.	Results from the Injection of the Wax of the Tubercle <i>Bacillus</i> indicating its Influence on Immunity and Susceptibility to the Tubercle <i>Bacillus</i> .
55.	Jan., 1914.	The Waters of Pennsylvania. An address before the State Board of Agriculture.
56.	Feb., 1914.	Reproduction and Race Betterment.
57.	March, 1914.	The State Tuberculosis Dispensary as a Social Service in Pennsylvania.
58.	rev. Apr., 1914.	The Preparation of the Biological Products distributed by the Pennsylvania Department of Health.
59.	May, 1914.	Insanitary Bath Tub and Laboratory.
60.	June, 1914.	On Housing.
61.	July, 1914.	Medical and Sanitary Inspection of Schools of Fourth Class Districts in Pennsylvania.
62.	Aug., 1914.	Progress in Preventive Medicine in Pennsylvania since the Creation of a Department of Health.



